APPENDIX - IV

MAHARSHI DAYANAND SARASWATI UNIVERSITY, AJMER

Format for Outline (Synopsis) of Proposed Research work
(to be supplied in six copies)

1. Name of Scholar (In English) : **MS. SURBHI AGARWAL**
   (In Hindi) : **सुश्री सुरभि अग्रवाल**
2. Title of the Research Work :
   (In English) : **Floristic and Phytogeographical studies of Nasirabad Valley of Ajmer**
   (In Hindi) : **नसीराबाद घाटी अजमेर का पादप जातीय एवं पादप भूगोलीय अध्ययन**
3. Location
   a. Institution/Department where the work is to be done : **Department of Botany S.P.C. Government College, Ajmer**
   b. Geographical area of Investigation, if any. : **Nasirabad Valley, Ajmer**
4. Introduction Importance of Proposed Investigation, Objective : **Encl.1**
5. Review (Work already done on the subject of proposed Research Study) : **Encl.2**
6. Research Gaps identified in the proposed field of investigation. (Based on the review) : **Encl.3**
7. Major Hypothesis, if any : **Encl.4**
8. Research methodology : **Encl.5**
9. List of references cited : **Encl.6**

Signature of the Candidate with date

Outline Approved

Name and Signature of supervisor with date & seal –

(Dr. Dilip Gena)
Department of Botany
S.P.C. Government College, Ajmer

Encl.1

4. Introduction and Importance of proposed Investigation and Objective :

The state of Rajasthan, formed by the union of numerous large and small princly states, is the second largest state of India. It occupies an area of about 3.42.274 sq km i.e. nearly 11 per cent of the total area of India. It has a wide range of habitats, climatic factors, physiography, soil types and geological antiquity, Phytogeographically, the state of Rajasthan forms the eastern extremly of the great arid and semi-arid belt of the world, the great Sahara desert belt passes through the western part of Rajasthan state. The major part of eastern and south-eastern region forms the western part of the gangetic plains; the southern region froms a part of Malva plateau and south-eastern region a part of Deccan plateau.

Prior to the publication of Hooker's flora (1872-97), local floras and lists were available for several regions of India, but almost nothing was written for Rajasthan. The lacuna was, however, very amply filled during the middle part of century and a large number of technical and semi-technical papers were published. The four floras published recently from Rajasthan have further enrished our knowledge regarding the flora and floral composition of the different regions of the state.

Encl.2

5. Review of work already done on the subject of proposed Research study –

The earliest recorded information on botanical explorations in Rajasthan is about Jecquemont's journey in 1832 from Delhi in Bombay via Ajmer and Neemuch. Later in 1868, Sir George King made collections in Rajasthan which resulted in his paper "Sketch of the flora of Rajputana, 1878". In the year 1869-70, Brandis botanized Rajputana forests which appeared in his "Forest Flora of N.W. & C. India, 1874", The next work on the botany of Rajputana was a report of tour by Dethie (1886). In 1890. Macadam published a list of plants from Mt. Abu. Adams (1899) in his book "The western Rajputana states" listed about 50 species of plants. Between 1918 and 1921, Blatter and Hallberg published the "Flora of the Indian Desert" which for about 30 years remained the only authenic systematic account of the plants of Rajasthan. Parker (1918) recorded a number of plants from Jaipur and Duthie (1903-29) in his "Flora of the Upper Gangetic Plain" included the major part of eastern and south-eastern Rajasthan. Ramachandra Rao (1941) and Sankhala (1951) published lists of some plants of the desert region.

In recent years a large number of publications dealing with the flora, floral composition, ecology etc. of Rajasthan have been published. These have been reviewed by Jain (1972), Bhandari (1978), Majumdar (1979), Shetty & Pandey (1979) and Sharma (1980).

Phytogeographical studies on different physiographic regions have also received due consideration during recent years (Vyas, 1964; Sharma, 1967; Jain, 1967; Singh, 1978 etc.), as also phytosoiological studies (Vyas, 1964; Bhandari & Sharma. 1977; Singh, 1978 etc.).

Encl. 3

6. Research Gaps identified in the proposed field of investigation :

Rajasthan is situated in the north-western part of India between 23º3’ and 30º12’ N. latitude and 69º30’ and 78º17.E. longitude, occupying an area of about 3,42,274 sq km. The elevation of land surface varies from 214 to 1375 m. In shape, it is an irregular rhomb with north-south and east-west diagonals, the former about 784 km and the latter 850 km long. The western and north-western boundaries are marked by Pakistan. In the north and north-east, it is bounded by Punjab, Haryana and Uttar Pradesh, in the east and south-east by Madhya Pradesh and in the south-west by Gujarat states of India.

The remarkable feature of Rajasthan is the Aravalli range, perhaps the oldest folded mountain range in the world. It intersects Rajasthan from end to end, diagonally running from Delhi to the plains of Gujarat for a distance of about 692 km. Within Rajasthan, the range runs from Khetri in the north-east to Khed Brahma in the south-west for a length of about 550 km. The elevation of of Aravalli range gradually rises in south-west direction, as it is 335 m at Delhi and in Rajasthan 792 m at Khetri, 913 m at Harshnath, 920 m at Kho, 1055 m at Raghunathgarh, 1100 m at Bijapur and

1727 m at Mt. Abu. Further south-westwards, the elevation gradually decreases to the plains in Gujarat. The loftiest and the most clearly defined section of the Aravalli is between Mt. Abu and Ajmer where the range stands like a barricade. Beyond Ajmer to the north-east, there are gaps in the Aravalli range near Sambhar, east of Sikar etc. Structurally, it is composed of rocks belonging originally to the delhi system, folded in a synclinorium occupying the site of geosyncline which has been deeply eroded. Aravalli range divides the whole of Rajasthan in to two natural divisions i.e. three fifth lying on north-west and two fifth on the east and south-east.

Encl. 4

7. Major Hypothesis, if any :

North-western Region is known sandy plain or the Rajasthan desert. It covers a total area of about 1,96,150 sq km spread over the districts of Ganganagar, Bikaner, Jaisalmer, Barmer, Jodhpur, Churu and parts of Nagaur (96%), Jalore (88%), Jhunjhunu (69%), Sikar (65%), Pali (45%) and Ajmer (9%). Physiographically, it is the eastern extention of Saharo-Thar desert covered by shifting and the fixed sand deposits. The western 2/3 part extending ovr Bikaner. Jaisalmer, Churu, western parts of Nagaur and western 2/3 parts of Barmer and Joshpur districts is covered by shifting and stabilsed sand-dues of various types, magnitude and orientation like longitudinal, barkhan.

The eastern 1/3 part lying between sandy arid plains in the west and the Aravallis in the east is semi-arid transitional plain. Here the older rocks protrude above the surrounding sandy surface more frequently. The southern part between the foot of the Aravallis and the Luni river is fertile and known as the Luni basin. The topography is is marked with hills with steep slopes and extensive alluvium plains covered with aeolian sand deposits.

Gullying is also a common feature in submontane region. North of the Luni basin upto the Rajasthan border is the plain area of interior drainage. This plain is full of sand hills, sand scapes and several low depressions in which salt and soda are deposited on drying. The important salt lakes in this area are Sambhar, Degana, Kuchaman and Didwana.

Encl. 5

8. Materials and Methods/Research Methodology :

The present research work shall be carried out along the following lines :-

- Survey and collection : All the localities will be visited time to time and again throughout the year but mainly during monsoon period. The Botanical excursions will be undertaken from time to time. Field trips will be arranged in such a way as to cover all the localities at more or less regular intervals to collect most of the Plants.
- Rainy season that is from July to October each year is the best time and attempt to visit as many places for the study habit and habitats of plants.
- Collection and Identification of taxa.
- Material of plants will be collect from different localities of sanctuary for life cultivation and for preservation in FAA. At least 10 herbarium sheet of each taxon of particular localities shall be prepared.
- Efforts will be made to identify the plants from fresh materials and common name in use by local people. The species shall be identified with the help of the floras.

- Photographic documentation of these plants will also be prepared including habit and habitat for the purpose of e-learning.
- Species belonging to genus will be arranged in the genus cover which shall beard the numbers as allotted in the systematic of plants.
- Details of habits, habitats and soil characteristics will regularly recorded during the collection tours for ecological studies.
- Drought resistance, moisture contents, total bound water, total free proline, photosynthetic pigment, total protein, and total starch, total sugar will be investigated.
- Due to the great variety of habitat conditions and consequently great diversity in flora and vegetation types. The subject of conservation of plant resources is very complex in Rajasthan yet different conservational studies which concern to local people and tribal's will be investigated in this purpose.

9. References :

Adams, A. *The Western Rajputana State.* London, 1899.

Ahluwalia, K.S. Contribution to the flora of Mt. Abu *Indian For*. 91:824 - 828. 1965.

Badhwar, R.L., A.C. Dey and A.L. Griffith. The afforestation of dry and arid areas. *Indian For. Bull.* 133. 1948.

Bajpai, M.r. and J.K. Verma. Weed flora of Jobner. *Ann. Arid Zone* 2 : 169 - 180. 1964.

Bakshi, T.S. The vegetation of Pilani and its neighbourhood. *Journ. Bombay Nat. Hist. Soc.* 52 : 484-514. 1954.

Banerjee, J. The role of vegetation in desert control. *Bull. Nation. Inst. Sci. India* 1: 277 - 283. 1952.

Barucha, F.R. Ecological studies of the Rajsathan desert soil. *Proc. Nation. Inst. Sci. India* 26 B : 233 - 256. 1960.

Bentham, G. and J.D. Hooker. *Genera Plantarum.* vol. 1-3. London, 1862-1883.

Bhandari, M.M. Native resource used as famine fond in Rajasthan. *Econ. Bot*. 28 : 73-81. 1974.

----- *Flora of the Indian Desert*. Scientific Publishers, Jodhpur, 1978.

----- and M.R. Mehta. Addition to the flora of Mt. Abu. *Indian Journ. For.* 1 : 133 - 137. 1978.

----- and S.C. Sharma. Biogeography of the Indian Desert. Trans. *Isdi & Ucds.* 2 : 80 - 91. 1977.

Bhimaya, C.P., B.N. Ganguli, I.S. Tyagi, M.D. Choudhary and R. Subbaygan. Species suitable for afforestation of different arid habitats of Rajasthan. Ann. Arid. Zone 2 : 162 - 168. 1964.

----- and R.N. Kaul. Some afforestation problems and research needs in relation to the erosion control in arid and semi - arid parts of Rajasthan. *Proc. All. India Dry Zone Afforestation Study Tour and Symp*. 336 - 352. 1962.

Biswas, K. Desert vegetation. *Bull. Nation. Inst. Sci. India* 1 : 247. 1952.

----- and S.R. Rolla. Rajpurana desert vegetation. *Proc. nation. Inst. Sci. India* 19: 411 - 421. 1953.

Blatter, E. and F. Hallberg. The Flora of the Indian desert (Jodhpur & Jaisalmer). *Journ. Bombay Nat. Hist. Soc.* 26 : 218-246, 525-551, 811-818, 968-987; 27 : 40-47, 270-279, 506-519. 1918-1921.

Brandis, D. *The Forest flora of the North - west and Central India*. London, 1874.

Bora, G.K. Afforestation in Rajasthan desert. *Winter school on development of Rajasthan Desert* 23-24 (Abstr.), Jodhpur, 1973.

Chavan, A.R. and S.D. Sabnis. Cyperaceae from Mt. Abu. *Journ. Indian Bot. Soc.* 39:27-29. 1960.

Chohan, J.G., G.L. Shah and R.J. Patel. Further contribution to the flora of Mt. Abu. in Rajasthan. Indian For. 93 : 769-770. 1967.

Chopra. I.C. and B.K. Abrol. Some medicinal plants suitable for cultivation in Indian Arid Zone. *Symp. Prob. Indian Arid Zone*, Jodhpur, 148-153. 1964.

Das, R.B. and S. Sarup. The Biological spectrum of the Indian desert flora. *Univ. Rajasthan Stud*. (Biol.) 36-42. 1951.

----- and C.P. Bhimaya. Pasture ecology of grassland of west Rajasthan. *Proc. Symp. Prob. Indian Arid Zone. Jodhpur*, 399-412. 1964.

Dawre, M.S., R.P. Pandey, G.P. Roy and B.V. Shetty. A contribution towards the flora of Ganganagar district. *Bull. Bot. Surv. India* 21: 129-134. 1979 (1981).

Dhillon, K.B.S. and P.S. Bajwa. A contribution to the botany of Ganganagar Dist., North Rajasthan. Ibid. 11:234-244. 1969.

----- and M.M. Bhandari some plants records for Rajasthan. *Journ. Bombay Nat. Hist. Soc.* 70 : 577-582. 1973 (1974).

Duthie, J.F. *A. Botanical tour in Merwara* (*Rajputana*) - a report. Calcutta, 1886.

----- *Flora of the Upper Gangetic Plains and of the adjascent Siwalik and Sub - Himalayan tract.* Calcutta, 1903-1929.

Gupta, R.K. and C.T. Abichandani. Air - photo analysis of plant communities in relating to edaphic factors in the arid zone of western Rajasthan. *Proc. Symp Recent. Adv. Trop. Ecol* Pt. 1: 57-66. 1968.

----- and S.K. Saxena. Some ecological observations on the vegetation of Mt. Abu in west Rajasthan. *Indian For*. 94 : 315-333. 1968.

----- and ----- Ecological studies on the prospect of developing some agro - industries in western Rajasthan. *The Natural Resources of Rajasthan* 1 : 199-211. 1977.

----- and S.K. Sharma. Grasses of the rangelands in arid Rajasthan *Journ. Agric. Trop Bot. Appl.* 18 : 50-99. 1971.

Gupta, R.S. A contribution to the flora of Rajasthan. *Indian For.* 91: 438-439. 1965 a.

----- Vegetation of Kota and its neighbourhood. Trop. Ecol. 6:63-71. 1965 b.

----- A study of the hydrophytes and marsh plants of Kota and environs. Ibid 7 : 153-162. 1966.

Hooker, J.D. (Ed.) Flora of British India vol. 1-7. Kent, 1872-1897.

Hutchinson, *J. Families of the Flowering Plants* (2nd ed.) vol. 1-2, London, 1959.

Jain, S.K. The flora of Mt. Abu in Rajasthan. *Proc. Indian Sci. Cong.* 49 : 312-313. 1961.

----- materials for the flora of Mt. Abu in Rajasthan. *Indian For*. 88 : 53-62. 1962.

----- Phytogeographic considerations on the flora of Mt. Abu. *Bull. Bot. Surv. India* 9 : 68-78. 1967 (1968).

----- Floral composition of Rajasthan - A review. Ibid. 12 : 176-187. 1970 (1972).

----- and N.N. Kotwal. On the vegetation of Shahabad in Rajasthan. *Indian For*. 86 : 602-608. 1960.

Johri, S.C. The genus Ipomoea L. in Rajasthan. *Journ. Econ. Tax. Bot*. 5 - 1113-1142. 1984.

Joshi, M.C. Plant ecology of Bikaner and its adjascent area in comparison with the rest of Western Rajasthan. *Journ. Indian. Bot. Soc.* 35 : 495-511. 1956.

----- A comparative study of the vegetation of some areas in Jaipur division. *Ibid*. 36 : 272-291. 1957.

----- A preliminary survey of the sand - dune vegetation of Pilani and its neighbourhood. *Ibid*. 37 : 309-327. 1958.

----- and C.B.S.R. Sharma. Study of grasses and sedges of certain areas in Jhunjhunu dist., Rajasthan. Proc. Symp. *Prob. Indian Arid Zone, Jodhpur*, 394-398. 1964.

----- and ----- Grasses of certain areas in Jhunjhunu dist., Rajasthan. *Indian For*. 92 : 570-575. 1966.

Kanodia, K.C. and U.R. Deshpande. Addition to the flora of Mt. Abu in Rajasthan. *Bull. Bot. Surv. India* 3 : 403-405. 1961.

----- and R.K. Gupta Sand - dune flora of Western Rajasthan. *Journ. Bombay Nat. Hist. Soc.* 65 : 681-695. 1968. (1969).

----- and P.C. Nanda. The genus Aristida in Western Rajasthan. *Indian For*. 94 : 296-302. 1968.

----- and S.R. Rolla. Grasses of Mt. Abu, Rajasthan state. *Ann. Arid Zone* 4 : 110-119; 5 : 49-62. 1965-1966.

King, G. Notes on famine food of Marwar. *Proc. Asiat. Soc. Bengal* 38 : 112-116. 1869.

----- notes on vegetable products used as food during late famine in Rajasthan. Trans. Bot. Edinberg. 10 : 198. 1870.

----- Sketch of the Flora of Rajputana. *Indian For.* 4 : 226-236. 1879.

Krishnaswamy, V.S. and R.S. Gupta. Rajputana Desert, its vegetation and its soil. *Ibid*. 78 : 595-601. 1952.

Macadam, Miss. *A list of trees and plants of Mt. Abu. 1-28*. Jodhpur, 1890.

Macabale. T.S. and A Kharadi. On some ecological features of the vegetation of Mt. Abu. *Proc. Nation. Acad. Sci*. B : 12-23. 1946.

Maheshwari, J.K. and V. Singh. Aquatic and Marsh- land plants of Bundi dist., Rajasthan. *Journ. Bombay Nat. Hist. Soc*. 70 : 437-446. 1974.

----- and ----- Supplement to the Synoptic Flora of Kota division (S.E. Rajasthan). *Bull. Bot. Surv. India* 18 : 155-160. 1976 (1979).

Majumdar, R.B. Notes on the Flora of Rajasthan - 11 (Additions to the Flora of N.W. Rajasthan). *Bull. Bot. Soc. Bengal* 23 : 35-40. 1969.

----- Synoptic flora of Kota division (S.E. Rajasthan). *Bull. Bot. Surv. India* 18 : 49-79, 105-160. 1976 (1979).

----- Flora of Rajasthan, East of Aravalli. *Ibid*. 19 : 23-24, 1977 (1979).

----- S.K. Murti and J.N. Srivastava. Notes on Rajasthan Flora I. *Bull. Bot. Soc. Bengal* (*J. Sen Mem. Vol*.) 461-468. 1969.

Malik, C.P. and I.S. Grover. *Argomone subfustformis Ownbcy* (Papaveraceac) - a new record for India. *Indian For*. 95 : 480-481. (1969).

----- & ----- The genus Argemons L. - Introduction in some Argemone species. Sci. & Cult. 41 : 220-223. 1975.

McCann, C. A bushman's holidays in the Abu hills. *Journ. Bombay Nat. Hist. Soc*. 43 : 206-217. 1942.

Meher - Homji, V.M. The arid zones of India : Bioclimatic and vegetational aspect. In Jaiswal, P.C. et al. (ed.) *Desertification and its control*, ICAR, 160-165. N. Delhi, 1977.

Mulay, B.N. and B.V. Ratnam. The vegetation found round about Pilani. Proc. Indian Sci. Cong. III. 64-65. 1950 (Abstr.).

----- and M.C. Joshi. A study of the problems of Rajasthan Desert. *Proc. Symp. Prob. Indian Arid Zone* 43-47. Jodhpur, 1964.

Nair, N.C. A study of the vegetation and the choice of species in the afforestation of Rajasthan. *Proc. Nation. Acad. Sci. India* 24 B : 164-176. 1954.

----- Flora of Chirawa. *Proc. Raj. Acad. Sci.* 6 : 49-64. 1956.

----- Vegetation of Jhunjhunu, Mandrella an the neighbourhood places. *Journ. Bombay Nat. Hist. Soc*. 58 : 433-440. 1961.

Nair, N.C. and R.K. Bharitya. A note on *Euryale ferax Salisb.* in Alwar. Rajasthan. Ibid. 59 : 323. 1962.

----- and M.C. Joshi. Sand-dune vegetation of Pilani and its neighbourhood. *Journ. Indian Bot. Soc*. 36 : 599-617. 1957.

----- and S.K. Malhotra. A study of the vegetations of Lohargal and its neighbourhood. *Bull. Bot. Surv. India* 3:139-151. 1961.

----- and G.S. Nathawat. Vegetation of Pilani and its neighbourhood, *Journ. Bombay Nat. Hist. Soc.* 54 : 91-106. 1956.

----- and ----- Vegetation of Harshnath, Aravalli hills. Ibid. 54: 281-301. 1957.

----- and K.C. Kanodia. A study of the vegetation of Ajit Sagar bundh, Rajasthan. *Ibid*, 56 : 524-557. 1959.

----- and T.A. Thomas. Three new plant records for Rajasthan. *Curr. Sci*. 31 : 26. 1962.

----- and T.T. Koshy. A taxonomic study of the genus *Indigofera* L. in Rajasthan. *Journ. Bombay. Nat. Hist. Soc*. 60 : 326-336. 1963.

-----, K.C. Konodia and T.A. Thomas. The vegetation of Khetri and its neighbourhood. *Rajasthan Acad. Sci*. 8 : 99-110. 1961.

Pandey, R.P. Rastriya maru udhyan avem marusthal main podhon ko surakshit rakhane ki sambhavanayan. In Jain, S.K. and V. Mudgal (ed.) Bharat ki Vanaspati 156-163. 1984.

----- and B.V. Shetty. A contribution to the flora of Pali dist., Rajasthan. *Journ. Econ. Tax. Bot.* 5 : 336-378. 1984.

----- A.N. Singh and B.V. Shetty. Addition to the flora of the Indian desert. *Bull. Bot. Surv. India* 24 : 132-144. 1982 (1984).

----- P.J. Parmar and G.P. Roy. A contribution to the flora of Churu district, Rajasthan. *Journ. Econ. Tax. Bot.* 7 : 323-349. 1986.

Parker, R.N. A Forest flora for the Punjab with Hazara and Delhi. First ed. 1918 (Fassimite reprint Bislien Singh Mahendra Pal Singh. 1973).

Parmar, P.J. New plant records from Rajasthan. *Bull. Bot. Surv. India* 26 : 167-169. 1984. (1986).

Parmar. P.J. A contribution to the flora of Sariska Tiger Reserve. Alwar district, Rajasthan. Ibid. 27 : 29-40. 1985. (1987).

----- and A.N. Singh. A contribution to the flora of Bhilwara district Rajasthan. *Journ. Econ. Tax. Bot.* 3 : 491-515. 1982.

----- R.P. Pandey and G.P. Roy. Studies on the vegetation of Bikaner district in Rajasthan. *Ibid*. 7 : 55-67. 1985.

Purj, G.S. and S.K. Jain. Flora of the Aravalli hills at Mt. Abu. *Proc. Indian Sci. Cong*. III. 327, 1958 (Abstr.).

----- and ----- Botanical aspect of dry zone afforestation in India *Proc. All India Dry Zone Afforestation Study Tour and Symp.* 268-273. 1962.

----- S.K. Jain. S.K. Mukerjee, S.Sarup and N.N. Kotwal. Flora of Rajasthan *Rec. Bot. Surv. India* 19 : 1-159. 1964.

Raheja, P.C. Influence of climate change on the vegetation of arid zone in India. *Ann. Arid Zone* 4 : 64-73. 1965.

Raizada, M.B. A botanical visit to Mt. Abu. *Indian For*. 80 : 207-215. 1954.

----- and V.S. Sharma. New plant records for Upper gangetic plains from Ajmer - Merwara. *Ibid*. 88 : 356-359. 1962.

Ramchandra Rao. Y. A list of some of the more common plants of the desert areas of Sindh, Baluchistan, Rajputana, Kathiawar and South - West Punjab with their local names as far as possible. *Misc. Bull. Indian Conunc. Agric. Res.* 43 : 1-45. 1941.

Ramdeo, K.D. Addition to the flora of Rajasthan. Indian For. 91 : 123-125. 1965.

----- Contribution to the flora of Udaipur (S.E. Rajasthan). *Univ. Udaipur*, Udaipur, 1969.

Rao, H.S. and M.P. Shiva. The role of non-timber forest product in Rajasthan's economy. *The Natural Resources of Rajasthan.* 1 : 165-180. 1977.

Ratnam, B.V. The vegetation of Lohargal. *Proc. Rajasthan Acad. Sci.* 2 : 26-36. 1951.

Rotla, S.R. and K.C. Kanodia. Studies on ecology and vegetation of the interior parts of Barmer and Jaisalmer district in Rajasthan. *Proc. Indian Sci. Cong.* III. 321-322. 1962.

Rolla, S.R. and K.C. Kanodia. Studies on ecology and vegetation of Jodhpur division, Rajasthan state. *Ann. Arid Zone* 1 : 16-46. 1962; 2 : 35-60, 189. 1963.

Roy, G.P. The genus Eragrostis P. Beauv. in Rajasthan. *Bull. Bot. Surv. India* 18 : 102-108. 1976 (1979).

Sankhala, K.S. Enumeration of the flowering plants of N.W. Rajasthan. *Univ. Rajasthan Stud*. (*Biol.*) 1 : 43-1951.

Sarup, S. A list of some common plants of Jodhpur and its neighbourhood. *Ibid*. 1 : 29-36. 1961.

----- Plant ecology of north - west Rajasthan, Proc. Internal. Symp. Desert *Res. Jerusalem. Special Publ. Res. Concil.* 2 : 335-345. 1953.

----- *Revised list of some common plants of Jodhpur and its neighbourhood*. 1-25. Jaipur, 1954.

----- A list of some common plants of Bikaner and its neighbourhood. 1-12, Jaipur, 1957.

----- Hydrophytes of Jodhpur. *Univ. Rajasthan Stud.* (*Biol*.) 3 : 61-70. 1958 a.

----- Halophytes of the Indian dfesert *Ibid*. 3 : 71-76. 1958 B.

----- *A list of some common plants of Jaisalmer and its neighbourhood*. 1-16. Jaipur 1958 c.

----- Hydrophytes of Bharatpur. *Proc. Indian Sci. Cong*. III. 410. 1960 (Abstr.).

----- and K. Dutta. Soil in relation to vegetation of Jodhpur. *Ibid*. 162. 1954.

----- and G.S. Puri. The vegetation types of the Indian desert. *Univ. Rajasthan Stud.* (*Biol*.) 4 : 57-85. 1960 a.

----- and ----- studies on vegetation of Arid Zone of India - II. The distribution of some desert plants in various habitats in Rajasthan state. *Ibid*. 4 : 87-88. 1960 b.

----- and L.N. Vyas. Ecological studies on the vegetation of Jodhpur tahsil *Journ. Indian Bot. Soc*. 36 : 589-590. 1957.

----- and ----- Ecological studies on vegetation of Jodhpur tahsil. *Univ. Rajasthan Stud*. (*Biol*.) 3 : 77-97. 1958.

Satyanarayan. Y. and Y.D. Gaur. Phytosociological changes of monsoon vegetation in semi-rocky habitats. *Journ. Indian Soc*. 47 : 371-381. 1968.

----- and S.K. Saxena. An account of weed of Central Research Farm. Jodhpur. Journ. Bombay Nat. Hist. Soc. 63 : 344-353. 1966.

Sen. N.N. Dry zone aflorestation in Rajasthan. Proc. All India Dry Zone Afforestation Study Tour and Symp. 323-335. 1962.

Shah, G.L. and R.J. Patel. See Chauhan. Shah and Patel 1967.

Sharma, B.M. Ecological Studies of weed of the Jaswant College compound, Jodhpur. *Proc. Nation. Acad. Sci*. India 31 B : 427-437. 1961.

----- Studies on vegetation of arid zones of India, VIII- Composition of some scrub communities of Churu, Rajasthan. Ibid. 32 B : 157-168. 1962.

----- Composition and structure of plant communities of Churu, Rajasthan. *Trop. Ecol*. 6 : 106-123. 1965.

----- Carbobn/nitrogen status of soil under some plant communities of Churu, Rajasthan. *Indian For.* 93 : 552-557. 1967.

----- Ecological studies of desert soil of Churu, Rajasthan (India) : PH status. Journ. Soil and Water Cons. India 16: 1-5. 1968.

Sharma. S. Some facts about the phytogeography of Rajasthan. *Univ. Rajasthan Stud*. (*Biol*.) 1965 : 25-32. 1967.

----- An enumeration of the flora of Jaipur dist. Ibid. 1-38. 1974 (Jaipur).

----- Floristic studies in Rajasthan - In Retrospect and prospect, *Journ. Econ. Tax. Bot.* 1 : 55-75. 1980.

----- and B. Tiagi. Flora of North - East Rajasthan. Kalyani publishers, New Delhi, 1979.

Sharma, V.S. The flora of Ajmer – a list of Trees, shurbs and woody climbers. *Journ. Bombay Nat. Hist. Soc*. 55 : 129-141. 1958.

Shetty, B.V. and R.P. Pandey. Studies on the flora of Rajasthan desert - A review. *Bull. Bot. Surv. India* 19 : 5-22. 1977 (1979).

Shetty, B.V. and R.P. Pandey. *Flora of Tonk district*. Botanical Survey of India, Howrah. 1983.

Singh, D. Some useful cucurbits for the Arid Zone in Rajasthan. Proc. Symp. *Prob. Indian Arid Zone*, Jodhpur 1 : 48-50. 1964.

Singh, V. A taxonomic study of the genus Cassia L. in Rajasthan. Bull. Bot. Surv. India 18:85-101. 1976 (1979).

----- Supplement to the synoptic flora of Kota division. *Ibid*. 18 : 155160. 1976. (1979).

----- Addition to the flora of Rajasthan. *Journ. Bombay Nat. Hist. Soc*. 74: 45-49. 1977.

----- phytogeographical reassessement on the flora of Rajasthan. *Ibid*. 74 : 444-452. 1978 a.

----- Phytosociological studies on winter weeds in south - east Rajasthan. *Trans. Isdt. Ucds.* 3 : 67-72. 1978b.

----- Some intereting plant records for Rajasthan. *Journ. Bombay Nat. Hist. Soc*. 76: 206-209. 1980.

----- Flora of Banswara district. Botanical Survey of India, Howrah, 1983.

----- Promising plants of Rajasthan. *Journ. Econ. Tax. Bot*. 4 : 133-139. 1983.

----- and P.J. Parmar. Poisonous and Harmful plants of Rajasthan - II. *Ibid*. 1 : 149-155. 1980.

Singh, V. and R.P. Pandey. Plants used in religious and magico religious beliefs in Rajasthan. *Journ. Econ. Tax. Bot.* 3 : 273-278. 1981b.

----- and ----- Economic and medicinal plants of Indian desert. In Alam Singh (ed.) *Desert Resources and Technology*. 1 : 307-368. 1983.

----- and B.V. Shetty. A survey of natural plant resources of Rajasthan desert. *First Indian Conf. Desert Tech.* Pt. II & III. 34-35 (Abstr.) Indian Soc. Desert Tech., Jodhpur, 1976.

----- and P. Singh. Edible wild plants of Eastern Rajasthan. *Journ. Econ. Tax. Bot*. 2 : 197-207. 1981.

----- and ----- Fibre yielding plants of Rajasthan. *Ibid*. 3 : 385-390. 1982.

----- and ----- Useful aquatic weeds of Rajasthan. *Ibid*. 4 : 633-638. 1983.

Shrivastava, T.N. Forest resources of Rajasthan. *The natural resources Rajasthan* 1 : 151-164. 1977.

Sutaria, R.N. Flora of Mt. Abu. *Journ. Univ. Bombay* (n.s.) 9b (5) : 64-68. 1941.

Tandon, S.K. *The vegetation of Ladnu* (Jodhpur), 17-26, Jaipur 1958.

Verma, D.M. A study of vegetation and soil properties in an enclosed area at Kailana (Jodhpur). *Trop. Ecol.* 5 : 52-59. 1964.

Verma, S.K. Forestry and afforestation practices. In Gupta, R.K. and I. Prakash (ed.), *Environmental Analysis of Thar desert*. 298-321. Dehradun. 1975.

Vyas, L.N. Some plants records for Rajasthan from Flora of Alwar *Univ. Rajasthan Stud*. (*Biol*.) 6 : 15-22. 1962 a.

----- On grasses of Alwar (Rajasthan). *Ibid*. 6 : 23-30. 1962 b.

----- On succession trends in vegetation of various habitats of Alwar, E. Rajasthan. *Ibid*. 6 : 31-38. 1962 c.

----- Vegetation of Jaisamand lake. Alwar. *Proc. Rajasthan Acad. Sci.* 9 : 45-47. 1962 d.

----- Notes on the Flora of Alwar. N.E. Rajsathan. *Indian For*. 90 : 688-694. 1964 a.

Vyas, L.N. A study of Hydrophytes and Marsh plants of Alwar and environs. *Journ. Indian Bot. Soc.* 43 : 17-30. 1964 b.

----- Vegetation of Alwar and its relationship with the north - eastern Rajasthan vegetation. *Ibid*. 43 : 322-333. 1964 c.

----- Studies on grassland communities of Alwar. *Ibid*. 43 : 490-494. 1964 d.

----- Studies on phytogeographical affinities of flora of N.E. Rajasthan. Indian For. 90 : 535-538. 1964 e.

----- Phytosociological studies on vegetation of sandy plains of Alwar district, N.E. Rajasthan Trop. Ecol. 5 : 60 - 66. 1964 f.

----- Vegetation of Parashuram hills and its neighbourhood. *Journ. Indian Bot. Soc*. 44 : 149-162. 1965.

----- Cyperaceae from Alwar. *Indian for*. 92 : 581-582. 1966.

----- Contribution to the flora of North - east Rajasthan. *Journ. Bombay Nat. Hist. Soc*. 64: 191-231. 1967.

----- and K.D. Ramdeo. Contribution to the flora of Rajasthan from Udaipur. *Indian For*. 91 : 672-675. 1965.

Waheed Khan, M.A. Climate of the dry zones. *Ibid*. 85 : 139-181. 1959.

(MS. SURBHI AGARWAL)
Signature of the Candidate with date

Outline Approved

(Dr. Dilip Gena)

Name and Signature of Supervisor
with date & Seal

APPENDIX - VI

MAHARSHI DAYANAND SARASWATI UNIVERSITY, AJMER

Certificate By Supervisor

Certified that

1. I am willing to guide the research work of **MS. SURBHI AGARWAL** on the above subject if he/she is registered for Ph.D.

2. To the best of my knowledge, the subject has not been studied and is not being studied so far in any University.

3. The subject is of sufficient scope to keep the candidate engaged for two years.

4. The subject will lead to a valuable contribution. I have been and approved the outline of proposed research work submitted by the candidate.

5. I have **06** (give numbers) Research candidates registered under my supervision and the serial number of this candidate whose application is being forwarded for registration is **03** (give the serial number).

6. The candidate is no in a close relation (the term of close relation is defined in the examination ordinance of the University).

_____

Signature of the
Supervisor with date

Certified that the available facilities will be extended to **MS. SURBHI AGARWAL** for research work if he/she is registered for Ph.D.

_____

Signature of the Principal/
Director of the Institution
with date

_____

Signature of the Head
Department with date

MAHARISHI DAYANAND SARASWATI UNIVERSITY, AJMER

PROPOSED RESEARCH WORK FOR

REGISTRATION AS STUDENT FOR THE DEGREE

OF Ph.D. IN BOTANY

ON

FLORISTIC AND PHYTOGEOGRAPHICAL STUDIES OF NASIRABAD VALLEY OF AJMER

By

MS. SURBHI AGARWAL

Under supervision of

DR. DILIP GENA

Department of Botany

Government College, Ajmer